

What is claimed is:

1 1. A manufacturing method of an active matrix substrate  
2 comprising the steps of:

3 a film lamination step for depositing a plurality  
4 of films to form laminated films on an insulating substrate;

5 a resist pattern formation step for forming a resist  
6 pattern having a plurality of film thicknesses on said  
7 laminated films;

8 a first etching step for etching said laminated films  
9 using said resist pattern as a first etching mask;

10 a resist etching step for etching said resist pattern  
11 to remove a thinner portion of said resist pattern ; and

12 a second etching step for etching said laminated  
13 films using a remaining portion of said resist pattern  
14 left after said resist etching process as a second etching  
15 mask.

1 2. The manufacturing method of an active matrix substrate  
2 according to claim 1, further comprising a step of forming  
3 a first conductive film pattern on said insulating substrate  
4 before said film lamination step in which an insulation  
5 layer, a semiconductor film, an ohmic semiconductor film  
6 and a second conductive film are deposited in order covering  
7 said first conductive film pattern to form said laminated  
8 films, wherein said resist pattern is formed so as to have  
9 a first portion of said resist pattern thicker than a  
10 second portion and said second portion of said resist  
11 pattern with an opening therein, at least top two films  
12 of said laminated films in said opening are etched and

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13 removed in said first etching step, said resist pattern  
14 is etched to remove said second portion in said resist  
15 etching step, at least an uppermost film of said laminated  
16 films is etched and removed in said second etching step,  
17 and after said resist etching step, a contact hole formation  
18 step for a remaining films of said laminated films in  
19 said opening left is etched and removed to form a contact  
20 hole in said insulation layer reaching a surface of said  
21 first conductive film pattern.

1 3. The manufacturing method of an active matrix substrate  
2 according to claim 2, wherein said first conductive film  
3 pattern is a gate wiring including a gate electrode, and  
4 after said contact hole formation step, further comprising  
5 a lead wiring formation step for removing said resist  
6 pattern, depositing a third conductive film on said  
7 insulating, forming a wiring formation resist pattern  
8 on said third conductive film, etching and removing said  
9 third conductive film together with upper films  
10 constituting said laminated films and locating higher  
11 than said semiconductor film by using said wiring formation  
12 resist pattern as a third etching mask to form source/drain  
13 electrodes consisting of said third conductive film and  
14 said upper films, and to form a lead wiring covering said  
15 contact hole.

1 4. The manufacturing method of an active matrix substrate  
2 according to claim 3, wherein any one of said source/drain

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3 electrodes is connected with said lead wiring of said  
4 third conductive film.

1 5. The manufacturing method of an active matrix substrate  
2 according to claim 3, wherein said lead wiring constitutes  
3 a terminal electrode to be connected with an external  
4 device in periphery of said insulating substrate.

1 6. The manufacturing method of an active matrix substrate  
2 according to claim 1, wherein said thinner portion of  
3 said resist pattern is etched by anisotropic etching using  
4 active species that are generated by plasma-enhancing  
5 a halogen compound gas and an oxygen gas.

1 7. The manufacturing method of an active matrix substrate  
2 according to claim 1, wherein said resist pattern has  
3 a plurality of film thicknesses and is formed by exposing  
4 a resist film once through a photomask with a mask pattern  
5 consisting of a light shielding portion, a light  
6 half-transmitting portion and a light transmitting portion,  
7 and developing said resist film.

1 8. The manufacturing method of an active matrix substrate  
2 according to claim 7, wherein said resist film consists  
3 of two resist films laminated having different exposure  
4 sensitivity from each other.

1 9. The manufacturing method of an active matrix substrate  
2 according to claim 1, wherein said resist pattern has  
3 a plurality of film thicknesses which is formed by exposing

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4 sequentially a resist film by using a photomask selected  
5 from photomasks with different mask patterns from each  
6 other for each exposure, and developing said resist film.

1 10. The manufacturing method of an active matrix substrate  
2 according to claim 9, wherein said each exposure is executed  
3 by using different amount of exposure light from each  
4 other.

1 11. The manufacturing method of an active matrix substrate  
2 according to claim 9, wherein said resist film consists  
3 of two resist films laminated having different exposure  
4 sensitivity from each other.

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